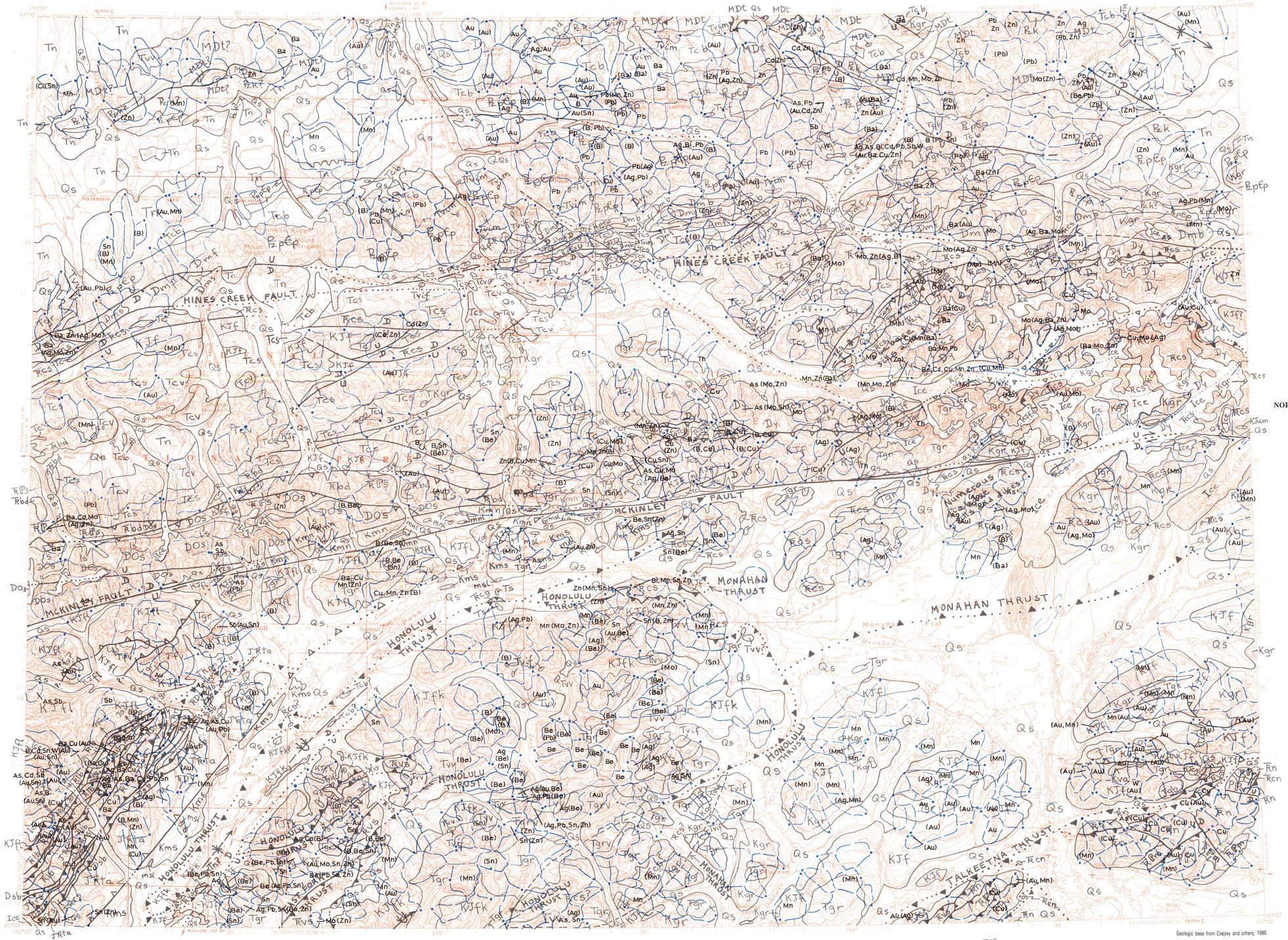

SCALE 1:250 000

5 0 5 10 15 MILES

5 0 5 10 15 KILOMETERS

CONTOUR INTERVAL 200 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
1989 MAGNETIC DECLINATION AT SOUTH EDGE VARIES FROM 26°00' TO 27°30' EAST

MAP LOCATION

DESCRIPTION OF MAP UNITS

ALL AREAS OF HEALY QUADRANGLE

SEDIMENTARY AND VOLCANIC ROCKS

Surficial deposits (Quaternary)

Qs

Hornblende dacite (Pliocene)

Thd

Nenana Gravel (Pliocene and Miocene)--Poorly consolidated conglomerate and sandstone

Tn

Coal-bearing rocks (Miocene to Eocene)--Mainly siltstone and shale with subbituminous coal and lignite

Tcb

Sedimentary rocks (Miocene? to Paleocene?)--Mainly poorly consolidated shale, sandstone, siltstone, and conglomerate

Ts

Volcanic rocks (Oligocene to Paleocene)--

Flows, pyroclastic rocks, and subvolcanic intrusions--Subaerial volcanic rocks and subordinate dikes ranging in composition from basalt to rhyolite

Tvv

Felsic subvolcanic intrusive rocks-Mainly dikes of rhyolite and dacite

Tvim

Mafic subvolcanic intrusive rocks--Mainly dikes of basalt and subordinate andesite

Tvif

Fluviatile and volcanic rocks (Eocene?)--Mainly conglomerate, sandstone, and siltstone and a few thin flows of basaltic andesite

Tfv

Cantwell Formation (Paleocene)--

Volcanic rocks subunit--Flows of andesite, basalt, rhyolite, and dacite and pyroclastic felsic rocks

Tcv

Sedimentary rocks--Mainly conglomerate, sandstone, and shale and a few thin coal beds and volcanic flows and tuffs

Tcs

PLUTONIC ROCKS

Granitic rocks (Oligocene to Paleocene)--Mainly granite and granodiorite

Tgr

Granitic and volcanic rocks, undivided (Oligocene to Paleocene)--Border zone between granitic rocks and Tertiary volcanic rocks

Tgrv

Granitic and hypabyssal intrusive rocks (Paleocene? and Late Cretaceous)--Mainly granodiorite

TKgr

NORTHERN, EASTERN, AND SOUTH-CENTRAL AREAS OF QUADRANGLE

SEDIMENTARY AND VOLCANIC ROCKS

Yukon-Tanana terrane

Rocks north of Hines Creek fault

Basaltic subvolcanic rocks (Late Cretaceous)--Mainly dike swarms

Kvb

Totatlanika Schist (Early Mississippian to Middle Devonian)--Carbonaceous slate, phyllite, and schist; metachert, quartz-orthoclase-sericite schist and augen gneiss, metavolcanic rocks

MDt

Felsic metavolcanic rocks (Late Devonian)--Metamorphosed rhyolite and quartz latite

Dmf

Metabasalt and subordinate metasedimentary rocks (Late Devonian)-Greenschist, metabasalt, and carbonaceous phyllite

Dmb

Metasedimentary rocks (Late Devonian)--Sericite schist, black slate, and chert

Dms

Keevy Peak Formation (early Paleozoic)--Mainly sericite schist, quartzite, arkosic schist, and black schist and phyllite

Pzk

***Pelitic and quartzose schist sequence (early* Paleozoic and Precambrian)**--Quartz sericite (carbonate) schist, quartzite, and black phyllite

PzpCp

Rocks south of Hines Creek fault

Calcareous sedimentary rocks (Late Triassic; middle? Norian to late Karnian)--Locally metamorphosed, carbonaceous, calcareous shale and sandstone and sandy to silty limestone. Includes sills and dikes of gabbro

Trcs

Yanert Fork sequence (Late Devonian)--Carbonaceous siliceous mudstone, slate, phyllite, and schist; impure quartzite and metachert, metavolcanic rocks, and marble interbeds. Also dikes and sills of gabbro

Dy

Flysch and associated rocks

Andesitic subvolcanic intrusive rocks (Late Cretaceous)--Hornblende andesite

Kva

Flysch sequence (Early Cretaceous and Late Jurassic)--Graywacke turbidite, shale, siltstone, and conglomerate Metamorphosed in southeast part of area.

KJf

Overthrust flysch-like rocks (Early Cretaceous and Late Jurassic)--Lithology identical to unit KJf

KJfk

Conglomerate, sandstone, siltsone, shale, and volcanic rocks (Early Cretaceous and Late Jurassic)

KJcg

Talkeetna superterrane (includes Wrangellia terrane)

Metavolcanic, metavolcaniclastic, and subordinate metasedimentary rocks (Late Triassic; late Norian)--Marine basalt, tuff, slate, and diabase sills.

TRvs

Chitistone and Nizina Limestones, undivided (Late Triassic; early Norian and late Karnian)

TRcn

Nikolai Greenstone (Late and (or) Middle Triassic)--Mainly subaerial flows of amygdaloidal basalt

TRn

Metasedimentary rocks sequence (Middle Triassic to Late Pennsylvanian?)--Black argillite, thin beds of volcanic breccia and sandstone, and limestone overlain by thin-bedded chert. Sills and dikes of gabbro

TRPm

Andesitic volcanic rocks (Early Permian? and Pennsylvanian)--Volcanic flows and breccias, probably marine

PPv

PLUTONIC ROCKS

Granitic rocks (Late and (or) Early Cretaceous)--Mainly tonalite, quartz diorite, and granodiorite, generally well foliated

Kgr

Tourmaline-bearing granite (Late or Early Cretaceous)

Kgrt

Ultramafic rocks (Early Cretaceous or Jurassic)--Plagioclase-bearing peridotite

KJum

Alkali gabbro (Late Jurassic)

Jgb

Metagabbro (Late Devonian?)

Dmg

SOUTHWESTERN AND WEST-CENTRAL AREAS OF QUADRANGLE

SEDIMENTARY AND VOLCANIC ROCKS

Ohio Creek area (Chulitna district)

Argillite, chert, sandstone, and limestone (Early Cretaceous and Late Jurassic)

KJa

Red and brown sedimentary rocks and basalt (Early Jurassic and Late Triassic)--Red sandstone, siltstone, conglomerate, and basalt overlain by brown sandstone and siltstone

JTrs

Limestone and basalt sequence (Late Triassic; Norian?)

TRlb

Red beds (Late Triassic)--Red sandstone, siltstone, and conglomerate

Tr

Volcanogenic and sedimentary rocks (Early Triassic to Late Devonian)--Tuffaceous chert, mudstone, and basalt breccia; flysch-like graywacke and mudstone; limestone

TrDv

Serpentinite, basalt, chert, and gabbro (Late Devonian)

Dsb

Flysch and associated rocks

Flysch sequence (Late Cretaceous to Late Jurassic)

KJfl

Crystal tuff, argillite, chert, graywacke, and limestone (Late Jurassic to Late Triassic?)

JTrta

Rocks of unknown terrane affinity

Conglomerate and volcanic sandstone (Late Triassic; late Norian)

TRcg

Nixon Fork terrane

Sedimentary rocks sequence (Middle Devonian to Ordovician)--Black argillite and siltstone, massive limestone (ls), thinly bedded limestone, and chert

DOs ls

Flysch and rocks of unknown terrane affinity

Flysch sequence (Early Cretaceous and Late Jurassic)--Same rocks as unit KJf in eastern and southern parts of quadrangle

KJf

Basalt, diabase, and subordinate sedimentary rocks (Late Triassic; Karnian and Norian)

TRbd

Flysch-like sedimentary rocks (Late Triassic to Pennsylvanian)--Impure sandstone, siltstone, and shale; minor limestone and chert

TRPs

Tectonic melanges

Melange south of McKinley fault (Late and (or) Early Cretaceous)--Dark-gray flysch, cherty tuff, volcanic sandstone, and blocks of limestone (msl)

Kms msl

Melange north of McKinley fault (Late and (or)Early Cretaceous)--Similar to unit Kms but contains recrystallized limestones (mnl) and ophiolitic rocks (mno), mainly serpentinite, basalt, and chert

Kmn mnl mno

Contact--Approximately located

Thrust fault--Showing direction of dip of overturned thrust fault. Dashed where inferred; dotted where concealed. Sawteeth on upper plate

High-angle reverse fault--Dashed where inferred; dotted where concealed. Sawteeth on upper plate

Fault--Dashed where inferred; dotted where concealed. Where displacement known, U, upthrown side, D, downthrown side; arrows indicate relative horizontal movement

Postulated position of fault prior to intrusion of plutonic and subvolcanic rocks

Anticline--Showing direction of plunge

Overturned anticline--Showing direction of dip of limbs and plunge

Syncline--Showing direction of plunge. Dashed where inferred

Overturned syncline--Showing direction of dip of limbs and plunge. Dashed where inferred

Sample locality showing outline of drainage basin area and listing elements with anomalously high concentrations in stream-sediment samples. Elements in parenthesis fall within the 95–98 percentile range, all others are in the 98–100 percentile range. See plate 1 for sample numbers

Ba (Au)

CORRELATION OF MAP UNITS

ALL AREAS OF QUADRANGLE

SEDIMENTARY AND VOLCANIC ROCKS | PLUTONIC ROCKS

Qs — Unconformity — Thd — Pliocene — Tn — Pliocene — Unconformity — Tcb — Miocene to Oligocene and Eocene — Unconformity — Tfv — Eocene(?) — Tcv / Tcs — Paleocene

Ts — Miocene(?) to Paleocene(?)

Tvv, Tvim, Tvif — Oligocene to Paleocene

Tgr, Tgrv — Oligocene to Paleocene

TKgr — Paleocene(?) to Late Cretaceous

Major unconformity

QUATERNARY, TERTIARY — CENOZOIC

TERTIARY(?) — CENOZOIC(?)

CRETACEOUS — MESOZOIC

NORTHERN, EASTERN, AND SOUTH-CENTRAL AREAS OF QUADRANGLE

SEDIMENTARY AND VOLCANIC ROCKS; rocks of each column occur in separate fault blocks

Yukon-Tanana terrane: Rocks north of Hines Creek fault	Yukon-Tanana terrane: Rocks south of Hines Creek fault	Flysch and associated rocks	Talkeetna superterrane (Wrangellia terrane)	PLUTONIC ROCKS
Kvb — Late Cretaceous	Kva — Late Cretaceous	KJf, KJfk, KJcg — Early Cretaceous and Late Jurassic (Unconformity)	KJum — Early Cretaceous or Jurassic	Kgr — Late and Early Cretaceous; Kgrt — Late or Early Cretaceous
			Jgb — Late Jurassic	
	Trcs — Late Triassic (Unconformity)		TRvs — Late Triassic (Fault)	
			TRcn — Late Triassic (Fault)	
			TRn — Late and (or) Middle Triassic (Unconformity)	
			TRPm — Middle Triassic to Late Pennsylvanian(?)	
			PPv — Early Permian(?) and Pennsylvanian	
MDt, Dmf, Dmb, Dms, Dy — Early Mississippian; Late Devonian; Middle Devonian				Dmg — Late Devonian(?)
Fault(?): Pzk, PzpCp				

SOUTHWESTERN AND WEST-CENTRAL AREAS OF QUADRANGLE

SEDIMENTARY AND VOLCANIC ROCKS; rocks of each column occur in separate fault blocks

Ohio Creek area (Chulitna district)	Flysch and associated rocks	Nixon Fork terrane	Flysch and rocks of unknown terrane affinity	Tectonic melanges
KJa — Early Cretaceous and Late Jurassic	JTrta — Late Jurassic to Late Triassic(?)	KJfl — Late Cretaceous to Late Jurassic	KJf — Early Cretaceous and Late Jurassic (Unconformity)	Kms msl, Kmn mnl mno — Late and (or) Early Cretaceous
JTrs, TRlb — Early Jurassic; Late Triassic			TRcg — Late Triassic	
Tr — Late Triassic (Unconformity)			TRbd — Late Triassic	
TrDv — Early Triassic to Late Devonian			TRPs — Middle Triassic to Pennsylvanian	
Dsb — Late Devonian				
		DOs ls, DOs — Middle Devonian to Ordovician		

CRETACEOUS, JURASSIC — MESOZOIC

TRIASSIC AND TRIASSIC(?) — MESOZOIC

PERMIAN, PENNSYLVANIAN, MISSISSIPPIAN, DEVONIAN AND DEVONIAN(?) — PALEOZOIC

SILURIAN AND ORDOVICIAN — PALEOZOIC

EARLY PALEOZOIC — PALEOZOIC

PRECAMBRIAN(?)

DISTRIBUTION OF ANOMALOUSLY HIGH CONCENTRATIONS OF SELECTED ELEMENTS IN STREAM-SEDIMENT SAMPLES, HEALY QUADRANGLE, ALASKA